

### **R E M A R K S**

Reconsideration of this application, as amended, is respectfully requested.

### **THE CLAIMS**

Claims 1 and 17 have been amended to recite that the liquid crystal layer comprises liquid crystal molecules, and that the liquid crystal molecules are twist-aligned by an angle in a range of 60° to 70°, as supported by the disclosure in the specification at, for example, page 19, line 18 to page 20, line 5.

In addition, claims 1 and 17 have been amended to recite a front retardation plate and a back retardation plate as previously recited in claim 15. See also, for example, front retardation plate 40 and back retardation plate 50 shown in Fig. 1, which, together with, for example, the liquid crystal element and front and back polarizing plates recited in claims 1 and 17, form a part of the liquid crystal display element 100 shown in Fig. 1.

Still further, claims 1 and 17 have been amended to remove some limitations that are no longer being relied upon to distinguish over the cited references. In particular, it is respectfully pointed out that claim 1 no longer recites: "a region that does not overlap with a region where the thin film

transistor is formed"; that the at least one reflective film "comprises a metal film"; and that "an entire surface of the reflective film is directly in surface-contact with a surface of said second electrode that faces the internal surface of said back substrate". In addition, it is respectfully pointed out that claim 17 no longer recites: that each of the plurality of reflective films "comprises a metal film"; that "an entire surface of each of the plurality of reflective films is directly in surface-contact with a corresponding one of the pixel electrodes at a surface of the pixel electrode that faces the internal surface of said back substrate"; and regions that "do not overlap with regions where said thin film transistors are formed".

Yet still further, claim 15 has been amended to better accord with amended independent claim 1.

No new matter has been added, and it is respectfully requested that the amendments to the claims be approved and entered.

#### THE PRIOR ART REJECTION

Claims 1, 3, 8, 10, 11, 17 and 18 were rejected under 35 USC 103 as being obvious in view of the combination of USP 6,614,496 ("Song et al"), US 2002/0154257 ("Iijima"), and US 2003/0063244 ("Fujimori et al"); and claims 7 and 13-16 were

rejected under 35 USC 103 as being obvious in view of the combination of Song et al, Iijima, and Fujimori et al together with one or more of US 2002/0041351 ("Baek"), US 2003/0160914 ("Ha"), and US 2004/0004681 ("Ozawa et al"). These rejections, however, are respectfully traversed with respect to the claims as amended hereinabove.

According to the present invention as recited in amended independent claims 1 and 17, a liquid crystal display device is provided which includes a liquid crystal layer, comprising liquid crystal molecules, that is provided between a pair of substrates. As recited in amended independent claims 1 and 17, the liquid crystal molecules of the liquid crystal layer are twist-aligned by an angle in a range of 60° to 70°. In addition, according to claim 1 and the corresponding recitations of claim 17 (which are in plural form), a reflective film is provided so as to correspond to a part of the at least one pixel such that a reflective portion and a transmissive portion are formed in the pixel. Still further, according to the present invention as recited in amended independent claims 1 and 17, front and back polarizing plates are provided at respective sides of the liquid crystal element, and front and back  $\lambda/4$  retardation plates are respectively arranged between the front and back polarizing plates and the liquid crystal layer.

That is, according to the present invention as recited in amended independent claims 1 and 17, the pixel(s) has/have a respective reflective film, the liquid crystal molecules of the liquid crystal layer are twist-aligned by an angle in a range of  $60^{\circ}$  to  $70^{\circ}$  (which is smaller than  $90^{\circ}$ ), and front and back  $\lambda/4$  retardation plates are respectively arranged between the front and back polarizing plates and the liquid crystal layer. With this structure, coloring of the display in reflective display caused by optical rotary dispersion is eliminated, and high display quality for both transmissive and reflective display is achieved.

It is respectfully submitted that the prior art of record does not disclose, teach or suggest the above described features of the present invention as recited in amended independent claims 1 and 17.

More specifically, as recognized by the Examiner Song et al discloses a transflective liquid crystal display device. It is respectfully submitted, however, that Song et al does not disclose, teach or suggest the alignment of the liquid crystal molecules recited in amended independent claims 1 and 17, or the  $\lambda/4$  retardation plates recited in amended independent claims 1 and 17.

Iijima, moreover, discloses a transflective liquid crystal display device including a retardation film 17 and a  $1/4$

wavelength plate 18. However, Iijima does not disclose, teach or suggest a liquid crystal layer having liquid crystal molecules that are twist-aligned by an angle in a range of  $60^{\circ}$  to  $70^{\circ}$  as recited in amended independent claims 1 and 17.

Fujimori et al, moreover, has merely been cited for the disclosure of opposing electrodes and also does not disclose, teach or suggest a liquid crystal layer having liquid crystal molecules that are twist-aligned by an angle in a range of  $60^{\circ}$  to  $70^{\circ}$  as recited in amended independent claims 1 and 17.

Baek has been cited for the disclosure of a homogeneous liquid crystal layer and for disclosure relating to retardation plates, and it is respectfully submitted that Baek does not disclose, teach or suggest a liquid crystal layer having liquid crystal molecules that are twist-aligned by an angle in a range of  $60^{\circ}$  to  $70^{\circ}$  as recited in amended independent claims 1 and 17.

Ha has been cited for the disclosure of a reflective surface having depressions and protrusions, and it is respectfully submitted that Ha does not disclose, teach or suggest a liquid crystal layer having liquid crystal molecules that are twist-aligned by an angle in a range of  $60^{\circ}$  to  $70^{\circ}$  as recited in amended independent claims 1 and 17.

Ozawa et al has been cited for the disclosure of the phase differences of the transmissive display regions T and reflective display region R of a liquid crystal display device being set

to  $1/2$  wavelength and  $1/4$  wavelength, respectively. It is respectfully submitted that Ozawa et al does not disclose, teach or suggest a liquid crystal layer having liquid crystal molecules that are twist-aligned by an angle in a range of  $60^\circ$  to  $70^\circ$  as recited in amended independent claims 1 and 17.

Thus, it is respectfully submitted that none of the cited references disclose teach or suggest the structure of the liquid crystal display devices recited in claims 1 and 17, as a whole, wherein the liquid crystal molecules of the liquid crystal layer are twist-aligned by an angle in a range of  $60^\circ$  to  $70^\circ$ , wherein a reflective film(s) such that a reflective portion and a transmissive portion are formed in the pixel(s) of the device, and wherein front and back polarizing plates are provided at respective sides of the liquid crystal element, and front and back  $\lambda/4$  retardation plates are respectively arranged between the front and back polarizing plates and the liquid crystal layer.

Accordingly, it is respectfully submitted that none of the cited references, whether taken singly or in combination, achieve or render obvious the structure of the present invention as recited in amended independent claims 1 and 17, and it is respectfully submitted that the prior art of record also clearly does not achieve the advantageous effects of the present invention whereby, by aligning the liquid crystal molecules and providing the pair of  $\lambda/4$  retardation plates as recited in

amended independent claims 1 and 17, high quality in both reflective and transmissive display can be achieved.

In view of the foregoing, it is respectfully submitted that amended independent claims 1 and 17, as well as claims 2-5, 8, 10-16 depending from claim 1 and claim 18 depending from claim 17, all clearly patentably distinguish over all of the cited references, taken singly or in any combination, under 35 USC 103.

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Entry of this Amendment, allowance of the claims and the passing of this application to issue are respectfully solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned for prompt action.

Respectfully submitted,

/Douglas Holtz/

Douglas Holtz  
Reg. No. 33,902

Frishauf, Holtz, Goodman & Chick, P.C.  
220 Fifth Avenue - 16<sup>th</sup> Floor  
New York, New York 10001-7708  
Tel. No. (212) 319-4900  
Fax No. (212) 319-5101  
DH:iv